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BENTON LAKE NATIONAL WILDLIFE REFUGE

BLACK EAGLE, MONTANA

Fiscal Year 1975

I. GENERAL

A. Weather Conditions

During the year 19.46 inches of precipitation were recorded at the refuge headquarters. This amount is in significant excess of the annual average of 14.02 inches.

The fall and early winter of 1974-75 was quite dry. Only 2.75 inches of precipitation were received during the six month period September through February. The spring of 1975 was the wettest in history with 13.76 inches of rain received March through June.

If not the most severe, the winter of 74-75 was certainly the longest on record. The refuge marsh units froze over on November 17. In normal years "ice out" occurs in mid March. This year prolonged cold temperatures maintained ice cover throughout April. The ice cover was finally broken up in early May by flood waters.

B. Habitat Conditions

1. Water

Benton Lake is an undrained basin and as such is the water depository point for Lake Creek. The Lake Creek drainage system contains approximately 74,000 acres.

During years of normal or below normal precipitation, Lake Creek produces insignificant or zero quantities of run-off water. During years of excessive precipitation run-offs of flood proportions occur. During the spring of 1975 three major floods produced 13,300 acre feet of run-off.

To appreciate the effects of receiving this quantity of water one should realize that the total storage capacity of the six refuge pools (at maximum water standing elevations) is only 13,327 acre feet. Fortunately, 1974 water management was such that only 23% of this storage capacity was utilized prior to the receipt of spring flood waters.

The adverse effects of the spring floods are discussed below.

- a. The dikes impounding Pools 1 and 2 were under extreme stress on three different occasions. During peak flows water was flowing over both dikes. Though damage was minimal, it is miraculous that both dikes were not breached.
- b. After flood waters had stabilized, Pools 3, 4, 5 and 6 were 0.8 foot over their maximum water standing elevation. High winds combined with excessive water levels to create erosion damage along 8 miles of dike. Damage is severe along an estimate two miles of dike facing.
- c. Water levels within Pools 3, 4, 5 and 6 will remain near maximum through the summer and winter of 75-76. This will subject the dikes to possible future damage by ice and/or wave action.
- d. The refuge had embarked on a program of seasonal water management in Pools 3 and 4 which was designed to control botulism losses, provide improved breeding pair habitat and make available 1500 acres of dewatered pool basins for nesting cover management. This program was totally disrupted by flood waters and cannot be returned to its pre-flood level for at least two more years.
- e. Pool 4 basin contained 900 acres of excellent nesting cover in the form of annual foxtail. This valuable resource was destroyed by flood waters.

The beneficial aspects of this spring's floods are discussed below.

- a. At current electric rates the 13,300 acre feet of water delivered to the refuge by floods represents a pumping value of \$29,000. The water management plan developed for calendar year 1975 proposed a pumping program that would have cost \$16,000. Flooding resulted in the termination of the proposed pumping program.
- b. As Benton Lake is an undrained basin all water loss is by evaporation. Under normal operations the salinity of impounded waters increases slightly from year to year. Flood waters received were quite fresh and have significantly lowered the salinity of impounded waters.

- c. Pools 3, 4, 5 and 6 have in past years been the units associated with botulism losses. With levels at or near maximum these units have their minimal amount of feather edging. The fully inundated condition of these pools should alleviate the botulism this coming summer.

2. Food and Cover

At the time of flooding, Pools 3, 4, 5 and 6 were either dry or shallowly flooded. When inundated, existing aquatics and dry basin vegetation was flooded over. During the spring migration these pools were large rather sterile bodies of water and not very attractive to waterfowl.

The development of aquatic vegetation was delayed due to the unseasonably cool spring weather.

Later in the summer Pools 4, 5 and 6 developed good stands of submergent and emergent vegetation.

II. WILDLIFE

No Swan?

A. Migratory Birds

1. Canada Goose Production

By mid April there were nine pair of Canada geese attempting to nest. This was the highest breeding pair inventory since establishment efforts were undertaken. Unfortunately, floods and exceptionally cold weather during May disrupted nesting activities. Seven of the nesting pairs abandoned nesting activities. One goose continued nesting efforts but was unable to hatch her nine eggs. Colder than normal temperatures during the incubation period may have been responsible. One pair of Canadas was successful in hatching 6 young. Sure it wasn't those hunters?

The effects of the 75 nesting season on goose production at Benton Lake could be devastating. With only six new birds added to the minimal population of breeders, we do not expect many breeding pairs in 1976.

2. Duck Production

a. FY 75 Production

Our estimate of waterfowl production for FY 75 was 9,890 ducks produced, all species.

This is the lowest production estimate in the last several years. It is representative of the steady decline in production that has occurred as a result of dewatering various pools for botulism control.

b. FY 76 Production (FY 75 Breeding Population)

During the 1975 spring migration the refuge contained 5,700 acres of marsh habitat. This was the largest marsh acreage available to spring migrants since 1970 and was twice the amount of marsh habitat available to 1974 migrating birds. For reasons described in the section on Food and Cover, the marsh units were not attractive to breeding pairs.

The 1975 breeding pair inventory (1840) was the lowest since the refuge became fully operational in 1966.

The excessive precipitation received during the spring of 75 created new and excellent pair habitat throughout this portion of Montana. The availability of off-refuge pair

habitat also contributed to the low inventory of breeding pairs on the refuge.

3. Waterfowl Starvation Problem

The spring migration of swans, geese, Mallards and Pintails arrived in the Great Falls area on schedule (mid March). Ice conditions concentrated these populations on the open rivers. The birds fed primarily on stubble fields.

The blizzard of April 7 - 9 made this food supply unavailable to the migrants. The limited food supply provided by the free flowing rivers was soon exhausted and starvation losses were occurring by April 11.

With several hundred thousand waterfowl caught in North Central Montana the loss potential was exceptionally high. A feeding program was initiated. Surplus grain was obtained from Medicine Lake and CMR Refuges and surplus government sources. This grain was shipped into Benton Lake and the state managed Freezeout Lake. Feeding was conducted at Benton Lake, Freezeout Lake and at points along the Missouri River.

Feeding helped alleviate the problem. Over 50,000 ducks were utilizing the grain at Benton Lake. Though no mass die-offs were observed, it was felt that waterfowl starvation losses were probably significant though scattered.

4. Eared Grebe Starvation

Eared Grebes arrived on the refuge in early May. Each spring we notice that several individuals of this species succumb to the elements. This year we observed a greater level of mortality which continued for several weeks. Several individuals unable to flee were caught and given a surface examination. All grebes caught and examined were in an emaciated condition.

As previously mentioned, the marsh units were ice covered until early May. It is believed that the prolonged cold weather had retarded the development of invertebrates on which the Eared Grebe is dependent, resulting in a starvation situation.

5. Shorebirds

Shorebird inventories were not conducted in FY 75. Due to the total absence of mud flats during the spring migration, very little shorebird use was received.

B. Upland Game Birds

Nothing of significance to report.

C. Big Game Animals

Most observations of Pronghorned Antelope involved only one to seven animals. In one instance, however, 18 antelope were observed in grazing unit 5. This was the greatest number of Pronghorns observed since the early spring of 1972.

D. Other Mammals

1. Richardson's Ground Squirrel

In the early spring of 1975 the population of Richardson's Ground Squirrels on refuge grasslands was estimated at 3 per acre for a total population estimate of 16,500 animals. This population was virtually eliminated by a series of natural events.

In early March weather conditions were normal. Ground squirrels came out of hibernation as is their habit this time of year. We assume that this species has consumed its stored food supply by the time of emergence and that it is dependent on open foraging for its sustenance.

The latter half of March produced numerous snow storms which disrupted foraging activities and placed this species under stress. During April 7 through 9 a severe blizzard was received. Snow depths were two feet on the level. By April 10 it was possible to catch ground squirrels by hand. Animals caught in this manner were on the verge of starvation. It was estimated that 80% of the ground squirrel population was lost due to starvation.

Following the April blizzard ground squirrels were still fairly common. The surviving population was estimated to be in excess of 3,000 animals. Production appeared to be good and numerous young were observed in late April.

During May and June a record breaking 9.44 inches of precipitation was received. Some of this rain came in the form of heavy rains; 1.79 inch received May 5 and 6 and 1.78 inch received June 18 and 19. It is probable that these rains resulted in a high level of young ground squirrel mortality due to drowning.

It is also theorized that surviving squirrels were subjected to high levels of predation during the early summer. Vegetative growth on native grasslands excelled anything that had previously been observed at Benton Lake. These unusual cover conditions would benefit predator species and work to the detriment of ground squirrels who require large open areas around their burrows to protect them from predators.

Though neither losses due to drowning nor excessive predator loss were authenticated, it is known that during May and June the ground squirrel population dwindled to near zero levels.

2. Meadow Vole

The Meadow Vole was added to the refuge mammal list during the year. A specimen was identified by Rod King on March 13, 1975. The refuge mammal list now contains 20 species.

3. Black Tailed Prairie Dog

An attempt was made to introduce Black Tailed Prairie Dogs to Benton Lake. Ten individuals were trapped on U.L. Bend Refuge and released in a 100 by 100 foot enclosure which had been prepared here. The animals spent one night in the enclosure and then departed for destinations unknown. A second attempt at introduction will be made next fiscal year.

E. Raptors

Nothing of significance to report.

F. Other

Nothing of significance to report.

G. Fish

Nothing of significance to report.

H. Reptiles

Nothing of significance to report.

I. Disease

Botulism continues to diminish as a major management problem at Benton Lake. The 74 outbreak resulted in a mortality of only 883 ducks and 126 individuals of other species.

A detailed report covering the 1974 botulism outbreak was prepared for station files and a copy submitted to the Area Office. Materials presented in that report will not be repeated here.

III. REFUGE DEVELOPMENT AND MAINTENANCE

A. Physical Development

1. Marsh Development

Topography maps of the Pool 4 marsh basin showed the potential for managing two shallow impoundments within this unit. The lower sub-impoundment (4c) with waters impounded at 3615.0 would have five hundred eighty-six surface acres and impound 262 acre feet of water. Existing Pool 4 dikes and water control structures permitted management of this sub-impoundment without the need for additional facilities.

The upper sub-impoundment was designed for a W.S. elevation of 3617.0. It would total 299 surface acres and impound 248 acre feet of water. Additional facilities were required to create and manage the sub-impoundment.

Portions of Pool 4 that would not be inundated by sub-impoundment management were designated 4b and contained 1148 surface acres. This portion of the pool was to have been managed for nesting cover.

The facilities constructed to develop Pool 4a are described as follows: A terrace type dike 2,046 feet long with a top elevation of 3618.5 was constructed. The dike was equipped with a 12 inch draw down pipe with screw gate. A 100 foot wide spillway with a 3617.0 foot flow line was constructed on the north end of the dike.

A water control structure was required to tap Pool 2 for water needed to manage the upper sub-impoundment in Pool 4. The structure is a 4 foot by 6 foot by 8 foot steel box divided into inflow and outflow compartments by stop logs. It was installed in Pool 2 dike with a 3618.0 foot flow line and overflow elevation of 3622.0. The structure is equipped with two 22 inch by 36 inch by 16 foot inflow pipes and two 22 inch by 36 inch by 50 foot outflow pipes.

The sub-impoundments were placed in operation in the fall of 1974 and proved quite productive in producing waterfowl utilization. The sub-impoundments were particularly attractive to Pintails.

Flood waters filled Pool 4 to above maximum levels entirely disrupting sub-impoundment management. It will require at least two years to return to sub-impoundment management.

2. Duck Blind Construction

Eleven permanent duck blinds were constructed during this year. Six were constructed in Pool 4c and five erected in Pool 4a.

The blinds were constructed of heavy planking and surrounded by a mound of dirt. The inside dimensions are: 7 feet long, $2\frac{1}{2}$ feet wide and 4 feet deep. A bench was installed $1\frac{1}{2}$ feet above the gravel floor.

The blinds were not productive for waterfowl hunting in the fall of 1974. The blinds were new and the dirt fill raw. The mounds did not blend in with surrounding cover and were avoided by ducks.

Eight of the eleven blinds were modified to serve as goose nesting structures. They were not utilized by nesting geese.

3. Fence Rehabilitation

Three miles of Boundary fence were rehabilitated. Rehabilitation involved removing corner and brace post and resetting in concrete. Line posts were straightened and replaced if necessary and the wire restretched.

One quarter mile of new fence was constructed to replace a section of badly deteriorated older fence.

4. Muddy Creek Pumping Station

Motors 2 and 3 (350 hp) were reconditioned by the Westinghouse Service Center in Butte. This work consisted of disassembly, inspection of parts, reassembly and test run, steam cleaning, varnish application and bake drying. In addition, the lower guide bearings were replaced in both units.

New splash boards were purchased and installed in the Muddy Creek dam.

5. Headquarters Area

Benton Lake Refuge is forced to haul the water used in the headquarters complex. Consumption was averaging 6,000 gallons per week. While this consumption level was known to be excessive, we could find no evidence of leaking lines. This spring we did observe surface water along a segment of the line.

The original black pipe system was twelve years old and had previously been used to flow highly corrosive well water. It was assumed that the entire system needed to be replaced.

The new system consisted of 256 feet of 1½ inch PVC pipe and 408 feet of 1 inch PVC pipe. Consumption levels dropped to 3,000 gallons weekly following installation.

As part of our energy conservation program the power company was instructed to remove the three automatic mercury yard lights that had previously been installed on the headquarters area. These lights consumed 70 kwh per month. The total energy saving potential involved in automatic yard lights throughout rural America is astronomical. It is our contention that these lights are not essential but merely a monument to man's fear of the darkness.

Fluorescent light fixtures were purchased and installed in the shop building.

6. Equipment

Performed a major engine overhaul on the Cat 12 grader. This unit also received a new paint job.

A commercial shop performed a major overhaul on the International 460 diesel utility tractor.

The following items of equipment were acquired:

- Honeywell-Pentax 35 mm camera with 50 mm and 200 mm lenses
- Bausch & Lomb 7 x 50 center focus binoculars
- Rebuilt Lycoming engine for airboat (180 hp)
- Portable 225 amp AC arc welder
- Trash compactor
- 2 electric ranges for residences
- 2 hot water heaters for residences
- 8 foot john boat for water sampling work

B. Plantings

1. Aquatic and Marsh Plants

None

2. Trees and Shrubs

None

3. Upland Herbaceous Plants

In October 150 acres which were to be seeded to grass were treated with fertilizer at the rate of 40.5 pounds of actual "N" and 21.0 pounds of actual "P" per acre.

The 150 acres were seeded on an acre basis with the following mixture:

| | |
|-----------------------------|---------------|
| Tall Wheatgrass | 4 PLS pounds |
| Intermediate Wheatgrass | 3 PLS pounds |
| Yellow Blossom Sweet Clover | .5 PLS pounds |
| Ladak Alfalfa | .5 PLS pounds |

During March 65 acres of established grass were treated with 34 pounds actual "N" per acre.

4. Cultivated Crops

Cooperator Lawrence Suek harvested 3,054 bushels of feed barley from 150 acres planted the previous fiscal year. Mr. Suek participated in the grass establishment program as his rent by purchasing grass seed and fertilizer.

During the spring of 75 two cooperators seeded 96 acres to barley. These fields will be seeded to grass in the spring of 1976.

C. Collections and Receipts

None

D. Control of Vegetation

None

E. Planned Burning

None

F. Fires

None

IV. RESOURCE MANAGEMENT

A. Grazing

In May of 1975 the refuge manager met with Marv Kaschke, Hugh Cosby and Joe Wirak to develop background material for a refuge grazing plan.

During the 1974 grazing season Units 2, 4 and 5 north were not utilized. Units 1, 3, 5 south, 6 and Power were grazed. The grazing season was July 1 through September 30, 1974. Permittees on all but the Power unit were asked to remove their cattle by September 27 (just prior to the opening of waterfowl season). The grazing fee was \$3.10 per AUM except for the Power unit where the rate was \$2.75 per AUM. A cow and calf were regarded as 1½ AUM.

| Grazing Unit | Acres | Permittee | AUM's Utilized | AUM's/Acre |
|--------------|---------------------|------------|----------------|------------|
| 1 | 720.5 | Ewing | 84.75 | 0.12 |
| 3 | 837.5 (native) | Golie | 66.75 | 0.35 |
| | 690.0 (pool basin) | LeFebvre | 153.25 | |
| | 1527.5 (total area) | L. Suek | 77.85 | 0.19 |
| | | Total | 297.85 | |
| 5 South | 667.0 | E. Suek | 149.11 | 0.22 |
| 6 | 959.0 | Hinderager | 176.60 | 0.33 |
| | | Prinzing | 59.45 | |
| | | White | 82.65 | |
| | | Total | 318.70 | |
| Power | | LEE | 33.35 | N/K |

B. Haying

None

C. Fur Harvest

None

D. Timber Removal

None

E. Commercial Fishing

None

F. Other Uses

None

V. FIELD INVESTIGATION AND APPLIED RESEARCH

There were no formal nesting studies conducted this year. The vegetative growth on native pastures was exceptional. Informal nesting surveys were conducted to determine if waterfowl nesting was occurring as a result of the improved cover conditions. These surveys indicated a possible nesting density of one nest per 14 acres.

Formal nest studies have been proposed for CY 76. These studies will evaluate waterfowl nesting potential of native ranges at their maximized level.

VI. PUBLIC RELATIONS

A. Recreational Uses

1. General Visitation

General visitation is a vehicle tour of the refuge for a mix of activities including: wildlife observation, wildland appreciation, interpretive auto tours and photography. Approximately 6,500 such visits were received during FY 75 which is some 1,500 to 2,000 visits below normal for the activity. Inclement weather during the spring months was responsible for the decline in use.

2. Environmental Education

The Great Falls School System again utilized the refuge in its environmental education program. All 5th grade students were scheduled to tour the refuge. Inclement weather conditions severely disrupted this program. Only 1,000 students were able to participate.

In addition, "E.E." programs were presented to seven different classes and/or youth groups.

3. Public Affairs

The refuge produced several news releases, radio announcements and TV spots dealing with the 1974 waterfowl hunting program.

Last minute changes in steel shot regulations necessitated many of the releases.

B. Refuge Visitors

No specific comments.

C. Refuge Participation

Covered in A-3 above.

D. Hunting

1974 was one of the most successful duck seasons at Benton Lake. The season opened September 28, a week earlier than normal. Freeze up did not occur until November 17 resulting in a longer than normal season (50 days).

The use of steel shot was required on all even numbered days.
Lead shot was required on all odd numbered days.

Data pertaining to the 1974 hunting season is summarized on
the following chart.

E. Violations

| <u>Date</u> | <u>Name</u> | <u>Offense</u> | <u>Court</u> | <u>Action</u> |
|-------------|------------------|-------------------------|------------------|---------------|
| 09/28/74 | Tony Sentovitch | False statement-license | State | \$75.00 |
| 09/28/74 | William Gray | Unplugged gun | State | 3 days susp. |
| 09/30/74 | Robert McKnight | Drive illegal area | Fed. | \$25.00 |
| 10/02/74 | Gerald Wilkens | No stop - check station | Fed. | \$25.00 |
| 10/02/74 | Douglas Cracraft | No stop - check station | Fed. | \$25.00 |
| 10/04/74 | David Johnson | Late shooting | Warning Juvenile | |
| 10/04/74 | James Dixon | Late shooting | Warning Juvenile | |
| 10/06/74 | Gary Long | Unplugged gun | State | \$35.00 |
| 11/04/74 | Richard Oeleis | Shoot - closed area | Warning Juvenile | |
| 11/04/74 | Gary Meljie | Shoot - closed area | Warning Juvenile | |
| 11/27/74 | Paul Kluge | Shoot swan | Fed. | \$25.00 |

F. SAFETY

Stemmerman and Rodman received eight hours of defensive driving
training.

1974 WATERFOWL SEASON INFORMATION

| <u>Description</u> | <u>Total
Visits</u> | <u>Total
Hours</u> | <u>Av. Hrs/
Visit</u> | <u>Total Birds
Bagged</u> | <u>Birds
Bagged/Visit</u> | <u>Cripples
Lost</u> | <u>Cripples/
Bird Bagged</u> |
|------------------------|-------------------------|------------------------|---------------------------|-------------------------------|-------------------------------|--------------------------|----------------------------------|
| Total Season - 50 days | 3464 | 12,606 | 3.64 | 5133 | 1.48 | 1688 | .33 |
| Lead Season - 25 days | 3029 | 10,930 | 3.61 | 4402 | 1.45 | 1364 | .31 |
| Steel Season - 25 days | 435 | 1,676 | 3.85 | 729 | 1.68 | 324 | .44 |

VII. OTHER ITEMS

When the annual narrative report requirement was dropped we became concerned about the need to document events and information for future reference and historical purposes. These alternative forms of reporting are discussed below.

A. Annual Reports

Annually we prepare a report covering in detail each of the significant operations at this refuge. At Benton Lake these reports cover the following management areas:

- Water Management
- Waterfowl Production
- Nesting Studies
- Botulism
- Public Hunting

We find that reports done on a subject basis result in more detailed reporting than when the reports are addressed in an annual narrative report. Further, they are more timely as they are prepared shortly after the event or action has taken place. We are convinced that these reports are more meaningful and useful at the field level. We believe that they are the proper vehicle for reporting to the next level of authority (Area Office).

B. Job Reports

We maintain records of expenditures by specifically defined jobs. At the end of each fiscal year a job report is prepared. In chart form man hours by individual by job are shown as well as total dollars labor and total dollars supplies and material by job. In addition, a narrative report is prepared that describes what was accomplished in each job area. When appropriate, details as to how the job was accomplished are also documented.

We find these annual job reports to be an excellent planning tool, valuable as a reporting tool and useful when responding to inquiries by higher authority. Further, these reports provide an excellent summary of the management program. They would provide any interested party with an accurate picture of how this refuge functions.

C. Wildlife Reports

We prepare and file by species memorandums describing significant

wildlife events, data and associated information resulting from special wildlife investigations and information developed from periodic inventories or observations.

In summary, we feel that the above procedures coupled with other required reports (such as refuge output reports) provide for the refuge and area office level a better reporting system than that of the annual narrative report.

For this station preparation of an annual narrative report is an unrelished task of recompiling and rereporting already well documented information.

SIGNATURE PAGE

Submitted by:

.....

Lyle A. Stemmerman
Refuge Manager

Date November 19, 1975

Approved, Area Office:

Date

.....

Burton W. Rouds
Area Manager

Concurrence:

.....

Robert M. Ballou
Chief, Division of Land Management

BENTON LAKE NATIONAL WILDLIFE REFUGE

SUMMARY REPORT

July 1, 1975, through December 31, 1975

All essential information describing the events and accomplishments of this period have been duly reported in detail in various other reports. Only brief comments on the more important aspects of refuge operations are offered here.

During the early spring of 1975 the refuge received 13,300 acre feet of flood water. All pools were filled to maximum water management levels or above. Water management activities were curtailed during the period. Pool levels were allowed to gradually decline due to evaporation and transpiration losses.

A detailed water management report for CY 75 is on file at the refuge, area and regional offices. This report also contains a detailed analysis of the flooding problems at Benton Lake.

Waterfowl production levels were the lowest in recent history. The sterile habitat conditions produced by the early spring floods resulted in a low breeding pair population. Waterfowl production estimates were as follows:

| <u>Species</u> | <u>Number of Young Produced</u> |
|-----------------|---------------------------------|
| Mallard | 40 |
| Gadwall | 1270 |
| Wigeon | 60 |
| Pintail | 307 |
| Green-wing Teal | 67 |
| Blue-wing Teal | 934 |
| Shoveler | 754 |
| Canvasback | 14 |
| Redhead | 22 |
| Lesser Scaup | 270 |
| Ruddy | <u>252</u> |
| Total | 3990 |

Additional waterfowl production details may be found in the report to the refuge files "CY 75 Waterfowl Production Estimates".

Benton Lake marshes did not produce a botulism outbreak in 1975. This was the first year since 1968 that botulism losses were not recorded. Water management practices are believed to be responsible for controlling

— "Mother Nature" ?

the botulism problem. A detailed report, "Botulism Report - Calendar Year 1975" is on file in the area and refuge offices.

During the 1975 waterfowl season 2,795 hunter visits were received accounting for 10,200 activity hours of recreation. No effort was made to evaluate the harvest. A detailed report describing various aspects of the hunting program is on file in the refuge and area office.

Operations during the period were limited to routine operations and maintenance. These activities are recorded in the annual job report for Fiscal Year 1976.

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